LIFE SATISFACTION OVER THE FIRST FIVE YEARS FOLLOWING BURN INJURY

A Dissertation

by

JESSICA LYNNE HOSKINS

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2012

Major Subject: Counseling Psychology

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ABSTRACT

Life Satisfaction Over the First Five Years Following Burn Injury. (August 2012)

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Individuals with burn injuries increasingly survive their injury, but we know little about their psychological outcomes following the injury. This study examines life satisfaction outcomes for 260 individuals who sustained burn injuries and were assessed repeatedly over a five year period post-discharge with the Life Satisfaction Index (LSI), Functional Independence Measure (FIM), and Family Satisfaction Scale (FSS). Structural equation modeling was used to predict life satisfaction (LSI) based on functional impairment (FIM), family satisfaction (FSS), pain, and employment variables. Study participants were assessed at 12 months, 24 months, 48 months, and 60 months post discharge. Each time period assessed was analyzed as a model of life satisfaction predictors; additionally, a prospective model was proposed which combined data from all four time points in one path analysis of predictors of life satisfaction at 60 months post discharge.

Results indicate that family satisfaction, functional independence, employment, and pain did not explain the variance associated with life satisfaction scores (variance explained ranged from 4% at 24 months post discharge to 11% at 60 months post discharge). Few paths in all five of the models proposed proved significant, suggesting

that other factors influence life satisfaction in individuals with burn injuries. These results constitute an important addition to the limited literature surrounding psychological outcomes of those who suffer burn injury and have implications for future studies to advance research on this issue.

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CHAPTER I

INTRODUCTION

In the United States, approximately 500,000 individuals present annually for treatment of burns; about 40,000 of whom require hospitalization (Esselman, 2007). These individuals are typically men, ages 20-40, with fire being the cause of over 60% of all burn injuries (Askay & Patterson, 2010; Esselman, 2007). In the decade from 1985 - 1995 the death rate following a burn injury decreased by 33%. Individuals with larger burns (more than 50% of total body surface) had the largest decrease in mortality, resulting in an increase in individuals with burns entering the rehabilitation population (Askay & Patterson, 2010; Esselman, 2007). Generally speaking, the rehabilitation process for burn injuries has largely mimicked a medical model, with a mission to promote physical healing and an assumption that the psychological adjustment following burn injury would imitate that associated with other disabling conditions (Askay & Patterson, 2010).

Individuals who sustain burn injuries face unique obstacles in their adjustment, most notably in pain management; procedures during the healing process (debriding, disinfecting) can be more painful than the initial injury itself (Askay & Patterson, 2010). Individuals with more procedural pain report symptoms of poorer adjustment, an

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This dissertation follows the style of *Rehabilitation Psychology*.

association that remains even when pre-injury adjustment is considered (Ptacek, Patterson, Montgomery, & Heimback, 1995). Pain and overall physical functioning tend to improve during the first two years following injury (Ullrich, Askay, & Patterson, 2009) Additionally, individuals who sustain burn injuries report greater psychosocial impairment due to their condition than that observed among persons with other medical conditions, suggesting that impairment may be more related to psychological functioning than physical (Williams et al., 2003).

Previous research indicates that the first year after hospitalization is almost universally a time of high distress for individuals with burn injuries (Patterson & Ford, 2000). The psychological distress following burn injury is said to be the "most disabling of secondary complications" (Fauerbach, Bresnick, & Smith, 2007). This is an unfortunate circumstance considering the fact that often the physical needs of these individuals take priority over emotional or psychological needs (Askay & Patterson, 2010). Encouragingly, the strains associated with the first year of adjustment tend to taper off for most individuals, particularly symptoms associated with depression and anxiety (Patterson et al, 1993).

Statement of the Problem

Interestingly, while much of the literature focuses on the prevalence of psychological maladjustment following a burn injury, few studies have focused on the variables that influence the course of adjustment over time (Klinge, Chamberlain, Redden, & King, 2009). While emerging research is beginning to address the

psychological variables that impact outcomes post-injury, few studies to date specifically considered burn victims. Studies indicate that groups differ in their post-rehabilitation outcomes by nature of injury or illness, suggesting that research specifically addressing burn victims is both timely and necessary to adequately inform their treatment (Marinic & Brkljacic, 2008; Strine, Chapman, Balluz, Moriarty, & Mokdad, 2008; Van Campen & Cardol, 2009;).

Rationale for the Study

Little is known about the predictors of life satisfaction relative to individuals who sustain burn injuries. Studies on quality of life and life satisfaction post injury tend to focus on the period immediately following burn injury, from discharge to one year later (Blades, Jones, & Munster, 1979; Patterson & Ford, 2000; Patterson et al., 1987), despite the fact that the "…first year post burn injury is the most difficult for adjustment" (Patterson, Everett, Burns & Marvin, 1992). Studies document an overall decrease in life satisfaction post burn injury (Patterson et al., 2000), but none establish whether if trajectory is static over the course of several years. Researchers advocate models of rehabilitation that incorporate "biosocial" predictors of outcomes (Patterson et al., 2000). As a group, individuals incurring burn injuries have been described as "heterogeneous" in psychological and adjustment factors independent of the shared nature of their injuries (Patterson, et al., 1987). Consequently, longitudinal research that identifies individual psychological and social predictors of optimal psychological adjustment following burn

injury may better inform their care in inpatient, outpatient, and community-based settings.

Individuals vary tremendously in their abilities to cope and adjust following an acquired disability such as a burn injury; differences can be conceptualized as a result of a plethora of behavioral and social variables that affect their individual roles, routines, and daily activities of living. Elliott and Warren (2007) describe a dynamic model of adjustment useful for conceptualizing these factors. The model describes the influence of enduring personality characteristics as well as environmental and social characteristics on the individual's appraisal process which in turn influences psychological well-being and physical health. Within the model, components of psychological well-being have a bidirectional relationship with physical health. In persons with an acquired disability, behavioral and environmental/social factors have predicted life outcomes above and beyond those associated with categorical definitions of disability or loss of functioning. As such, the importance of psychological and social/environmental factors cannot be ignored in studies of adjustment following disability such as a burn injury (Elliott & Warren, 2007).

Research Question and Hypothesis

The primary research question in this study will involve the effect of the following factors on overall life satisfaction in a population of individuals who sustained burn injuries:

- Pain,

- Functional Impairment,
- Family Satisfaction
- Employment

The study hypotheses were derived from previous research concerning adjustment following burn injury, and from our theoretical understanding of the importance of personal, social and environmental factors in the adjustment process following disability (Elliott & Warren, 2007). They include:

- The presence of persistent pain will be negatively associated with life satisfaction.
- Greater functional impairment will be negatively associated with life satisfaction.
- Greater family satisfaction will positively associated with life satisfaction.
- Being employed will be positively associated with life satisfaction.
- Pain, functional impairment, family satisfaction, and employment will explain significant amounts of variance in life satisfaction scores over the first five years following burn injuries.

CHAPTER II

LITERATURE REVIEW

While it was previously believed that the size and nature of the burn injury would predict the emotional adjustment of the patient, empirical research indicates that pre-injury adjustment, psychopathology, and social support are actually better predictors of adjustment over time (Patterson & Ford, 2000). Subsequent to hospitalization for a burn injury, individuals report spending more time socializing with family and less time interacting with non-family members as well as decreased time spent at work or with colleagues. The impact of a burn injury on the patient's marriage is less clear, with some research indicating that burn injuries lead to more marital discord while others claim that the evidence is inconclusive (Patterson & Ford, 2000; Patterson et al, 1993). The role of social support appears to be crucial in the adjustment of individuals following burn injury, as it moderates both reports of pain and symptoms of PTSD (Ptacek, et al., 1995), and influences overall adjustment (Patterson et al, 1993). These and other psychological and social factors appear to play a crucial role in determining the long-term outcomes of individuals who sustain burn injuries.

Studying life satisfaction outcomes is consistent with theoretical models of adjustment post disability. Dynamic models of adjustment (Elliott & Warren, 2007) assert that positive environmental and social elements can increase well-being among persons with acquired disability. The following discussion of the literature will demonstrate that the study of life satisfaction following acquired disability warrants continued empirical scrutiny, as the dynamics that influence life satisfaction and well-

being among persons with disabilities appear to differ from those observed among the general population (Dunn, Uswatte, & Elliott, 2009). The research to date makes a compelling case for studying life satisfaction among individuals with specific disabilities, such as burns, as a distinct subgroup within the larger population of individuals with disabilities. Yet much of the extant research on life satisfaction post burn injury has focused on the magnitude of increases or decreases in life satisfaction over time. Research has documented a trend toward decreases in life satisfaction up to 12 months post burn injury as well as lower levels overall compared to the general population (Blades et al., 1979; Costa et al., 2003; Oster, Willebrand, & Ekselius, 2011; Patterson et al., 2000). Less is known about the specific predictors of life satisfaction for these individuals, which will be discussed further in the following literature review.

The following discussion will focus on life satisfaction in the general population, including discussions of relevant trajectories, predictors, and importance. Life satisfaction as it applies to individuals with disabilities will be explored, particularly as it relates to differences seen within this heterogeneous population. The discussion of life satisfaction will conclude with a review of the research related specifically to individuals with burn injuries and then transition into a description of the predictors chosen for this study.

Life Satisfaction

The study of optimal adjustment following acquired disability is theoretically and clinically important (Dunn et al., 2009). Individuals who report higher levels of adjustment after the onset of severe disability often report experiences that do not readily

conform to prevailing theoretical models of life satisfaction; similarly, available research indicates that certain types of disabilities are associated with steady declines in life satisfaction over time in a manner not easily explained by these same theoretical models (e.g., Resch et al., 2009). Life satisfaction is an important aspect of quality of life (Diener, Emmons, Larsen, & Griffin, 1985), and it is often studied with self-report measures that assess a subjective, personal assessment of well-being and satisfaction with life (e.g., the Life Satisfaction Index; Dijkers, Whiteneck, & el-Jaroudi, 2000).

Personal and environmental factors as well as the interaction between the two influence the experience of life satisfaction by individuals. Relevant factors include self determination, resources, purpose, and a sense of belonging (Schalock et al., 2002). Marinic and Brkljacic (2008) found that 48% of the variance in life satisfaction could be accounted for by satisfaction with health, relationships, and achievement. Diener, Lucas, and Scallon (2006) argue for "non neutral" set points in the experience of individual well-being, with the balance between positive and negative emotions tending toward the positive site of the spectrum in the long run for most people. Innate personality characteristics contribute to the set point of overall well-being and satisfaction, although this rather "global" category is composed of several discrete variables including life satisfaction (Lucas, Diener, & Suh, 1996). Lyubomirsky, Sheldon, and Schkade (2005) adopt the notion of a "set point" to chronic levels of happiness, although they emphasize the contributions of circumstantial factors and activities and suggest these concepts as interventions for improving happiness.

One can also understand life satisfaction reports as the theoretical framework of "hedonic adaptation," in which individuals are believed to revert to baseline levels of overall well-being through a process of adaptation following a significant change or disability, much as a set point would suggest (Lucas, 2007).

Studies of life satisfaction among persons with disabilities display mixed results in terms of trajectory and predictors. A study of male veterans over the span of two decades revealed that life satisfaction scores peaked at age 65, with extroverted veterans experiencing the highest (and most consistent) levels of life satisfaction (Mroczek & Spiro, 2005). The trajectory of life satisfaction across the lifespan is elusive, with evidence that elderly women in an assisted living facility report significantly lower levels of life satisfaction than their male counterparts (Cummings, 2002), while a separate study observed that older individuals in general report greater life satisfaction (Yang, 2006). Additionally, both marital status and physical health were found to be associated with life satisfaction (Mroczek & Spiro, 2005). Social cognitive variables also contribute to reports of life satisfaction, including personality variables and access to environmental resources. For instance, one study found satisfaction with social cognitive "domains" such self-efficacy or goal progress was the most important and most consistent predictor of overall life satisfaction (Lent et al., 2005). Life satisfaction has been found to be the best predictor of mortality in non-Western adults, even after controlling for age, sex, education, marital and health status (Collins, Glei, & Goldman, 2009).

Life Satisfaction Among People with a Disability

Research on life satisfaction in individuals with disabilities suggests a more complex psychological reaction to disability than the theories of well-being set points and hedonic adaption would indicate (Deiner, et al., 2006; Lucas, 2007). In two longitudinal studies, individuals with disabilities reported a moderate to large decrease in happiness with "little adaptation over time" (Lucas, 2007). The onset of a disability can mean the loss of physical functioning or a body part, difficulties that can be compounded by individual differences in the "rate and extent of adaptation" to disability (Diener, et al., 2006). The evidence is far from overwhelmingly pessimistic, however, with evidence that some individuals report increased subjective well-being post disability (Dunn et al., 2009). While one study argues that the predictors of life satisfaction are consistent across individuals and populations (Schalock et al., 2002), others have found differences between the predictors of life satisfaction for groups with disabilities versus the general population (Marinic & Brkljacic, 2008; Strine, Chapman, Balluz, Moriarty, & Mokdad, 2008; Van Campen & Cardol, 2009). When differences were found between the general population and a group citing a disability, satisfaction with physical safety and acceptance in the community were significant predictors of life satisfaction only for the individuals with disabilities (Marinic & Brkljacic, 2008).

For individuals with chronic illness or disability, social support is recognized by multiple studies as being a critical predictor of life satisfaction (Bramston, Chipuer, & Pretty, 2005; Strine, et al., 2008), including in studies with both longitudinal and cross-sectional designs (Luger, Cotter, & Sherman, 2009). The relationship between injury and

life satisfaction is not always obvious: One study of individuals who had sustained traumatic brain injury found a nonlinear relationship between severity of injury and life satisfaction, with permanently injured groups and those who recovered both scoring higher on measures of life satisfaction than the moderately injured group (Mailhan, Azouvi, & Dazord, 2005). Interestingly, life satisfaction scores can actually increase to levels higher than those reported at pre-injury baseline in some participants despite an appearance of diminished quality of life by observers (Konigova, 1996).

Studies have documented different predictors for participants grouped by disability. Warren, Wrigley, Yoels, and Fine (1996) found evidence that persons with spinal cord injury (SCI) or traumatic brain injuries (TBI) should be considered as two separate and distinct groups based on the patterns of significant predictors of life satisfaction. The six predictors of life satisfaction for individuals with traumatic brain injury were found to be family satisfaction, memory independence, bowel independence, marriage, employment, and blaming oneself for the injury. Family activities, closeness to family, and self blame were the most significant predictors for those with SCI. Whiteneck and colleagues (2004) found environmental factors to be more related to life satisfaction than social participation in a study involving individuals with SCI. In an additional study involving individuals with TBI, mood, income, and time since injury were observed to be closely related to life satisfaction but no correlation with functional independence was observed (Corrigan et al., 2001). Other longitudinal research has demonstrated that decreases in functional abilities are strongly predictive of decreases in

life satisfaction over the first five years of living with a traumatic brain injury (Resch et al., 2009).

In a study on quality of life indicators for individuals with psychiatric disabilities, informal social support, mental health functioning, and job satisfaction directly affected subjective quality of life (Wu, 2008). Among individuals who recently sustained a spinal cord injury, positive psychological "facilitator" variables were found to contribute more to life satisfaction than functional barriers (Kortte, Gilbert, Gorman, & Wegener, 2010). For individuals with intellectual disabilities, life skills and "higher order" predictors like social support were associated with higher life satisfaction (Miller & Chan, 2008), while acceptance of disability, age, sex, marital status, hope, spiritual well-being, and employment were the best predictors for individuals with muscular dystrophy (Chen & Crewe, 2009).

Health concerns appear to be a significant predictor of life satisfaction in persons with a disability. As reported life satisfaction decreases, individuals are more likely to report poor or fair health and disability, and those with a chronic illness are significantly more likely to report lower levels of life satisfaction (Strine et al., 2008). The length of time since a disabling incident also appears to be positively correlated with life satisfaction measures, suggesting that individuals with a disability report higher levels of life satisfaction after longer periods of time have passed, but only if the injury is perceived as permanent (Smith, Lowenstein, Jankovic, & Ubel, 2009).

Life Satisfaction After Burn Injuries

Little is known about the factors that influence life satisfaction specific to individuals with burn injuries. While there is no one universally recognized and standardized measure of quality of life for individuals with burn injuries, researchers advocate for a "multidisciplinary approach" that incorporates psychological functioning and perceived quality of life as two of the seven "core domains of assessment" for treating a burn injury (Jaskille et al., 2009). The National Institute on Disability and Rehabilitation Research Burn Model System Database includes the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) as part of its mission to "evaluate the long-term sequelae of burn injuries". The database includes data collected up to two years post discharge for more than 4500 patients (Klein et al., 2007). While there seems to be some agreement that psychological factors such as subjective well being are important, little is known about the causal relationships between life satisfaction and other factors.

Some research seems to be consistent, such as studies finding the size of the burn injury is unrelated to reported quality of life post injury (Blades et al. 1979; Patterson, et al., 1987; Sheffield et al., 1988; Wrigley et al., 1995). Other research seems to indicate somewhat contradictory and confusing results, such as is the case with one study indicating that individuals did not "experience a change in perceptions" of quality of life following a burn injury (Cobb, Maxwell, & Silverstein, 1990) versus a finding that overall health related quality of life is lower for individuals with burn injuries compared to the general population (Oster, Willebrand, & Ekselius, 2011). This could be explained

in part by the finding that while individuals with burn injuries "adjust relatively well" approximately 25% developed "clinically significant psychological disturbances" such as phobias or somatization (Altier, Malenfant, Forget, & Choiniere, 2002).

To complicate matters further, a considerable number of individuals report quality of life scores higher than those at pre-injury, though improvements were not seen until at least 12 months after the burn was sustained (Blades et al., 1979). This is consistent with other studies that report life satisfaction scores for individuals with burn injuries are consistently lower than the normative population when measured immediately post discharge as well as during a 6 month follow up (Patterson et al., 2000). At the time of follow up, participants reported both increases in emotional distress as well as lower levels of life satisfaction, although an upward trajectory in life satisfaction was noted from the point of discharge to the six month follow up. The authors speculate that the lower life satisfaction scores could be a result of decreased social support over time and/or the full realization of functional impairments post discharge (Patterson et al., 2000).

Similarly, Moi et al. (2006) reported patients with burn injuries reported poorer generic health status compared to the general population forty-seven months post injury but reported overall quality of life as "good" and similar to the general population. However, impairment ratings fail to correlate significantly with psychosocial variables such as life satisfaction for individuals with burn injuries, a finding described by the authors as evidence that "complex, multidisciplinary variables…enter into burn outcome" (Costa et al., 2003).

Munster, Fauerbach, and Lawrence (1996) designed an instrument known as the Burn Specific Health Scale (BSHS) to measure quality of life in individuals with burn injuries; the authors documented extensive validation measures as well as evidence that the BSHS is capable of differentiating between individuals who return to work or do not, and the presence or absence of preinjury psychiatric illnesses. Cromes, Holavanahalli, Kowalske, and Helm (2002) used the BSHS as an outcome assessment in which better quality of life was associated with less emotional distress, pain, and "better community reentry" up to 12 months post discharge. Still others describe a combination of preinjury factors (such as the age of the individual) combined with injury characteristics (size and thickness) as the best predictors of quality of life post injury (Anzarut, Chen, Shankowksy, & Tredget, 2005).

Aside from these studies, there are few articles examining predictors of life satisfaction as an outcome. Searches including the keywords "life satisfaction" and "burn" return zero results as do searches limited to only "satisfaction" and "burn" in titles in the PsychInfo database. Searches in PubMed produce only seven relevant results when the keywords "burn" and "life satisfaction" are entered. When a search of "burn" and "quality of life" as keywords was conducted, almost seven hundred results were returned, but only about fifty were deemed relevant. Of those results, sixteen were found to be quantitative studies of outcomes related to life satisfaction or quality of life for individuals with burn injuries. Among these studies various assessment instruments were used, including: the Burn Specific Health Scale (BSHS) (Altier, Malenfant, Forget, & Choiniere, 2002; Anzarut et al., 2005; Blades et al., 1979; Cromes et al., 2002; Druery,

Brown, & Muller, M. 2005; Elsherbiny et al., 2011; Xie, Xiao, Zhu, & Xia, 2012); the SF-36 or SF-12 (Anzarut et al., 2005; Costa et al., 2003; Leblebici et al., 2006; Moi et al., 2006; Rosenbach & Renneberg, 2008; Xie et al., 2012); the Satisfaction With Life Scale (Costa et al., 2003; Patterson et al., 2000); the Life Satisfaction Scale (LoBello, Underhill, & Fine, 2004); the Sickness Impact Profile (Patterson et al., 1987; Williams, Doctor, Patterson, & Gibran, 2003); the Quality of Life Index (Sheffield, 1998); or a scale specifically created for the study (Blades et al.,1979).

These studies conducted assessments on individuals with burn injuries up to six years post discharge, with ranges varying widely and most assessing participants six months to two years post injury (Anzarut et al., 2005; Blades et al., 1979; Costa et al., 2003; Cromes et al., 1987; Patterson et al., 2000; Rosenbach & Renneberg, 2008; Xie, 2012; Williams et al., 2003).

Particularly symbolic of the state of research regarding outcomes following burn injury is the fact that Askay and Patterson's (2010) chapter "Psychological Rehabilitation in Burn Injuries" in the recent edition of the *Handbook of Rehabilitation Psychology* makes no mention of satisfaction with life, limiting discussion of psychological factors to those associated with coping, preinjury adjustment, and symptoms of pathology.

While studies of life satisfaction have varied tremendously in their emphasis on different predictor variables, the present study will examine individual, social and activity variables that have been associated with life satisfaction among persons with other disabling conditions. Specifically, functional impairment, family satisfaction,

employment, and pain will be examined as predictors of life satisfaction in individuals with burn injuries. A discussion of the specific measurement tools and corresponding psychometric properties for these variables will be presented in the Methods section. The discussion below will include information from studies indicating the validity of including these four predictors in a study of life satisfaction following burn injury.

Functional Impairment

The degree of functional impairment following acquired disability has been associated with quality of life for individuals with TBI in cross-sectional (Webb, Wrigley, Yoels, & Fine, 1995) and in longitudinal research (Resch et al., 2009). In individuals with multiple sclerosis, individuals who were unaware of their functional impairments reported high levels of subjective well-being, including global life satisfaction (Ryan et al., 2007). For older adults in an assisted living facility, functional impairment is significantly associated with well-being and life satisfaction (Cummings, 2002). This relationship has also been observed in individuals with dementia and cognitive impairment, with both reporting functional status as affecting life satisfaction (St. John & Montgomery, 2010). The established relationship between functional impairment and life satisfaction is crucial as individuals with burn injuries reported both health impairments and physical limitations 47 months post injury (Moi et al., 2006).

Employment

Employment is a goal often pursued by individuals with disabilities, though the relationship with life satisfaction is unclear. Although it is generally accepted that employment helps individuals with disabilities to live more satisfactory lives (Wu, 2008), at least one study found that the majority of participants with disabilities or chronic illnesses identified as "satisfied without work". In this case, although participants scored high on measures of life satisfaction they were not employed, a result that was significantly different from the general population in which unemployment tends to positively correlate with low measures of life satisfaction (Van Campen & Cardol, 2009). Conversely, one study found employment to be the strongest contributor to quality of life in individuals with TBI (Webb et al., 1995). Employment may also contribute to life satisfaction through its correlation with income level as ranked position of income predicts life satisfaction (Boyce, Brown, & Moore, 2010).

Vocational difficulties are one of the top complaints reported by individuals who sustain burn injuries (Patterson et al., 1987). Individuals with burn injuries who are unemployed may experience related physical and mental impairments that prevent them from working (Moi et al., 2006); however, a growing body of research suggests that most individuals return to work post-burn injury. Esselman et al. (2007) reported that 80% of individuals with burn injuries returned to work up to a year post injury; participants reported that although physical limitations continued to be important barriers to employment, psychological factors and employment conditions were important barriers as well. Similarly, Pallua, Kunsebeck, and Noah (2003) described

69% of participants in their study returning to work as measured approximately five years post injury; while the "early retirement" of participants who did not return to work was influenced by functional limitations, extent of body surface burned, and the age of individual. Dyster-Aas, Kildal, and Willebrand (2007) concurred with a finding that 69% of their participants also reported returning to work after a burn injury, with those who did not return to work reporting lower health-related quality of life but no difference in overall mood than those who did return to work.

There is a suggestion that perhaps the best predictor of returning to work post burn injury is the experience of employment prior to injury; Wrigley et al. (1995) found participants in their study were 171 times more likely to work post injury if they had employment prior to the injury. Burn severity was not statistically related to the employment outcomes of an individual with a burn injury.

Family Satisfaction

Little is known about how family satisfaction contributes to overall life satisfaction, particularly among individuals. Anecdotal evidence suggests that harmony and support within primary relationships, including the family of origin, would lead to higher levels of overall life satisfaction. In individuals with traumatic brain injuries, family satisfaction was predictive of trajectories of life satisfaction over the first five years following injury, although marital status was not (Johnson, Resch, Elliott, Villarreal, Kwok, Berry, & Underhill, 2010). Family support has also been linked to quality of life measures in individuals with TBI (Warren et al., 1996; Webb et al., 1995).

For individuals who sustain burn injuries, social support is both directly and indirectly related to post-burn adjustment and moderates the progress of rehabilitation independently of the severity of the burn. Because of this relationship, social support is often directly related to life satisfaction and overall quality of life for this population (Davidson, Bowden, Tholen, James, & Fellen, 1981; Li, 2005). Sveen et al (2011) described social support as a factor in resilience post-burn injury, but only in terms of the presence versus absence of others to provide support. There was no difference in "satisfaction" with social support between individuals with resilient trajectories and those with more problematic courses of recovery. Van Loey and Van Son (2003) postulate that "it is strongly suggested that social difficulties do occur in burn populations" but offer support for this statement largely in terms of the relationship between scars, disfigurement, and social relationships. Rosenbach and Rennegerg recommend "the inclusion of significant others…in the long term treatment of patients with severe burn injuries" as a result of finding a relationship between perceived social support and "positive traumatic growth" among individuals with burn injuries (2008). The specific relationship between family satisfaction and life satisfaction following a burn injury remains largely unstudied aside from one study which found a positive relationship between social support and life satisfaction among patients with burns (Patterson et al, 1993).

Purpose of the Present Study

The present study will examine the prospective and predictive relationships of functional impairment, family satisfaction, employment status, and pain to life satisfaction over the first five years following medical treatment of traumatically acquired burn injuries. In this process, the study will provide new information about important clinical and theoretical factors that influence life satisfaction that would stimulate new research in to this understudied aspect of quality of life in burn literature. Models that will be examined will be based on the Dynamic Continuum model of adjustment (Elliott & Warren, 2007); contextual and temporal relations between the predictor variables will be examined in the prediction of life satisfaction. In this fashion, the study assumes the more "holistic" view of adjustment among burn survivors (Sen, Greenhalgh, & Palmieri, 2010) considered vital in advancing understanding of the quality of life and development of strategic services following discharge.

CHAPTER III

METHOD

Participants

Participants included 260 individuals who presented with severe burn injuries requiring acute care treatment of at least three days duration as an inpatient in select Alabama hospitals. Most participants were men (80%; n = 209) and 20% were women (n = 51). Participants ranged in age from 18 to 96, with a mean of 35 years. The majority of those who participated were white (70%, n = 181), a substantial proportion self identified as African American (29%, n = 73), with the remaining participants identifying as either Asian or Other (n = 6). Half of the participants described themselves as employed full time at the time of injury (50%, n = 129), while another 6% described themselves as either a student, self employed, or employed part time (n = 24) with the remaining participants describing themselves as unemployed, retired, or other.

The severity of burn injury for each participant was assessed using the Abbreviated Injury Scale (AIS; Committee on Injury Scaling, 1985). The AIS assigns ordinal ratings of injury severity according to anatomic descriptors of injury with values ranging from 1 (minor) to 6 (unsurvivable). In the current sample, the majority of participants (43%) had injury ratings of moderate (n = 112, injury rating of 2), followed by injury ratings of serious (25%; n = 65; injury rating of 3). The remaining participants had injury ratings of minor (17%; n = 43; injury rating of 1), critical (7%; n = 17; injury rating of 4), severe (3%; n = 7; injury rating of 5), and unsurvivable (> 1%; n = 1, injury rating of 6).

Participants were recruited as part of a larger, longitudinal study involving individuals who had experienced one of four potentially disabling injuries. Those included in this study had sustained severe burn injuries and were discharged (alive) from a sample of nine hospitals in north-central Alabama between October 1, 1989 and September 30, 1992. Additional criteria for inclusion were: acute care stay of at least three days, residence and injury sustained in Alabama, at least 17 years of age at injury, and able to be contacted at specified intervals after discharge from the hospital.

The hospitals utilized for the study included five of Alabama's twenty busiest emergency departments (often a point of entry and first contact for those who sustain severe injuries), five of the fifteen trauma centers in Alabama, two out of three burn centers, and three of the fifteen hospitals providing either inpatient or outpatient rehabilitation services. Of the included hospitals, four were located in counties with a large urban center (Jefferson, Tuscaloosa, and Madison counties).

Procedure

Participants were initially identified from acute care medical records at the hospitals described, but were not contacted until 12 months after discharge. Individuals were mailed a letter explaining the study and including a pre-addressed "consent card" to be returned. Those who did not return cards were subsequently contacted via telephone to attempt to obtain consent. Those who consented were contacted by a trained interviewer to obtain necessary information. In the cases where the participant was

unable to answer questions over the phone, the patient's spouse, relative, or other identified caretaker was interviewed instead.

Data was collected from two sources: acute medical records and telephone surveys. From the acute medical records data was obtained on: etiology and severity of injury, clinical characteristics, source of payment, demographics, acute care treatment, and discharge disposition. Telephone surveys were used to collect data due to the large population studied, geographic coverage, and higher response rates generated compared to mailed requests. Telephone interviewers (who were certified vocational rehabilitation counselors) were trained in each instrument as well as given daily contact with the Core Project Coordinator. The Functional Independence Measure in particular included training with a film and the use of a version developed specifically for use over the phone.

Data was collected in phone interviews at 12, 24, 48, and 60 months post discharge on: social and demographic data, rehabilitation services, secondary complications, health status, medical services, psychological and physical adjustment to disability, social support, and rehabilitation outcomes. The follow-up interview conducted at 60 months post-discharge focused on quality of life issues.

Measures

Functional Independence Measure: The Functional Independence Measure (FIM) was used to assess functional abilities (Keith, Granger, Hamilton, & Sherwin, 1987). The FIM consists of 18 items completed by an examiner related to the participant's ability to complete activities of daily living with or without assistance from a caregiver. The 18

items are divided into two domains: motor related activities (13 items) and cognitive related activities (5 items). The participant's ability to perform the activity is rated on a seven point scale ranging from "unable" to "independent" with corresponding points. The FIM has demonstrated acceptable reliability across diverse settings, individuals, and raters (Ottenbacher, Hsu, Granger, & Fielder, 1996). The FIM has been found to "compare favorably to most standardized health measures used in medical practice" and has been used as a single dimension of care burden in studies (Stineman et al., 1996). Studies have found the FIM to have degree of internal consistency (coefficient alpha of .93) as well as the ability to detect functional gains during rehabilitation (Dodds, Martin, Stolov, & Deyo, 1993; Stineman, et al., 1996). The FIM has been used in several studies of adjustment following acquired disability (e.g., Kwok et al., 2008; Resch et al., 2009).

In this study, raw scores on the FIM ranged from 20 to 126 (12 months post discharge), 18 to 126 (24 months post discharge), 30 to 126 (48 months post discharge), and 26 to 126 (60 months post discharge). Lower scores on the FIM indicate greater impairment overall while higher scores indicate greater independence in activities of daily living.

In order to prevent ceiling affects in the FIM the scores were converted to linear measures using the Rasch scaling procedures (Bond & Fox, 2001; Linacre, 2003). The Rasch measurement model as described by Fischer (1976) allows researchers to construct valid measurements using a probabilistic formulation. This procedure ensures item reliability, stability, and quality while at the same time preventing gender item bias.

Because of these characteristics, Rasching is especially useful in measurements such as the FIM which may otherwise be confounded due to high ceiling effects. For a more detailed description of Rasch procedure, please refer to Resch et al. (2009).

Functional Independence was measured at 12 months, 24 months, 48 months, and 60 months post burn discharge.

Family Satisfaction Scale: The Family Satisfaction Scale (FSS) is a Likert type scale consisting of 14 items designed to measure family cohesion and adaptability created by Olsen and several researchers (Olson & Wilson, 1982). The FSS has been used in multiple research studies focusing on injuries, disability and/or chronic illness (Perlesz, Kinsella & Crowe, 2000; Warren et al. 1996; Webb et al., 1995; Underhill, LoBello, & Fine, 2004). Responses to items range from 1 (dissatisfied) to 5 (extremely satisfied) with a total possible score ranging from a low of 14 to a high of 70 possible points. Sample items include "how satisfied are you with your ability to say what you want in your family," ". . . with your family's ability to try new things," ". . . how often you make decisions as a family, rather than individually," and ". . . how clear it is what your family expects of you."

Olson and Wilson (1982) conducted several psychometric studies of the FSS, including studies of the validity and reliability of the instrument which resulted in an alpha coefficient of .92 as well as high degrees of internal consistency for the subscales of cohesion and adaptability (coefficient alphas of .85 and .84 respectively). In a study involving participants with TBI, the FSS was observed to have excellent internal validity as well as convergent validity (Underhill et al., 2004). The total score derived from the

FSS is consistent with measures of depression (Cumsille & Epstein, 1994) and with meaning of life, coping, and stress (Lightsey & Sweeney, 2008). Family Satisfaction was measured at 12 months and 60 months post burn discharge.

In this study raw scores on the Family Satisfaction Scale ranged from 11 to 70 (12 months post discharge) and 22 to 70 (60 months post discharge). Higher scores on the FSS indicate greater satisfaction with family relationships while lower scores indicate greater dissatisfaction. As with the FIM, the FSS raw scores were Rasched in this analysis, a statistical technique designed to ameliorate possible ceiling affects. This procedure ensures item reliability, stability, and quality while at the same time preventing gender item bias (Bond & Fox, 2001; Linacre, 2003).

Pain: This study was concerned with the presence of pain in participants based on the response to the question "Have you ever been told by a doctor that you have any of the following diseases or health conditions that are a result of your injury?", with "pain" as a subcategory and answers coded as either yes (1) or no (0). Pain was measured at 24 months, 48 months, and 60 months post discharge.

Employment: Type of employment in this study is based upon patient self report. Responses were categorized as: Employed (full, part, student or self employed; coded as 1), or unemployed (coded as 0). Employment was measured at 12 months, 24 months, 48 months, and 60 months post burn discharge.

Life Satisfaction Index: The Life Satisfaction Index-A (LSI-A) was developed by Neugarten and colleagues (1961) to assess life satisfaction in community-based research. The LSI-A consists of twenty items designed as an operational definition of "successful aging" or change over the course of a lifetime, including attainment of goals, adaptability, and feelings towards oneself. Sample items include, "The things I do are as interesting to me as they ever were", "As I look back on my life, I am fairly well satisfied", "I am just as happy as when I was younger", and "My life could be happier than it is now." Each item is scored 0 or 1 with the possible total score ranging from 0 to 20. Higher scores indicate greater perceived life satisfaction while lower scores indicate dissatisfaction with life. One study demonstrated the reliability of and validity of the LSI-A with a substantial (n = 609) population of individuals with traumatic brain injury. Reliability was established with internal consistency coefficients which ranged from .85 to .92, while validity was established through statistically significant positive correlations with instruments known to measure independence, health status, quality of life, and activity level (LoBello et al., 2004). Other studies also support the reliability and validity of the LSI-A (Adams, 1969; Rao & Rao, 1981; Wallace & Wheeler, 2002).

In this study participant raw scores ranged from 0 to 20 (12 and 48 months post discharge) and 1 to 20 (24 and 48 months post discharge). Higher scores on the LSI-A are associated with greater satisfaction with life while lower scores are associated with lower reports of life satisfaction. For the purposes of this study, raw scores on the LSI-A were Rasched. This procedure ensures item reliability, stability, and quality while at the

same time preventing gender item bias. Rasching has been shown to reduce ceiling effects in similar studies (Bond & Fox, 2001; Linacre, 2003).

Data Analysis

Structural Equation Modeling: Data in this study were analyzed using structural equation modeling (SEM), a statistical hybrid of both path analysis and factor analysis, to determine the relative contribution of each variable (pain, family satisfaction, functional independence) to overall life satisfaction in individuals who have sustained a burn injury. SEM has been described as having the capacity to "more accurately represent constructs through the use of multiple measures" (Weston, Gore, Chan & Catalano, 2008, p. 340), which makes it especially well suited for this type of statistical analysis. SEM was conducted using MPLUS software, with multiple measures collected at each of the various time-points. When conducted in this manner, the generalizability of SEM results will increase (Weston et al, 2008).

There are five generally accepted steps in the process of SEM: model specification, identification, estimation, evaluation of fit, and modification (Kline, 2005; Schumacker & Lomax, 2004; Weston et al, 2008). In the first step, the model is specified, or designed, based on theoretical or clinical assumptions as the relationship between the variables. This step has already been completed (see Figures A-E). Generally accepted conventions regarding the drawing of SEM models include using single direction arrows to indicate direct paths, or regression coefficients, while two-direction arrows represent either covariances or correlations between variables (Chan, Lee, Lee, Kubota, & Allen, 2007). During "identification", both latent and observed

parameters are specified in an adequate ratio (known as the T-Rule to statisticians). Next, model estimation is completed using MPlus, AMOS, and/or Lisrel.

After the model parameters have been estimated, the fourth step consists of evaluation of model fit. This is the step that will attempt to compare the specified model, or the one hypothesized by the researcher, with the data that the software has generated. In essence, it is a comparison of the ideal data to that observed in the study. Model fit can be ascertained in several ways, including the significance of estimated parameters, the overall fit indices, or the variance explained by latent variables (Weston et al, 2008). Lastly, SEM incorporates a step in which an alternate model can be generated and tested based on the data supplied by the previous steps, most notably including data of fit that would indicate alternate relationships between variables as better fits for the overall model.

SEM requires an adequate sample to be conducted, which varies based on the number of estimated parameters in the model. There is no universally accepted rule or threshold for what determines adequate sample size, with experts suggesting anywhere from 10 participants per observed variable (Mueller, 1996) to 3 to 5 participants per parameter (Bollen, 1989). Low samples sizes can lead to instability in the covariance matrix as well as low power which can affect the ability to detect significance in both the pathways as well as the covariances. Generally a sample size of 200 is sufficient to overcome these difficulties (Chan, Lee, Lee, Kubota, & Allen, 2007). Given the number of proposed parameters in this model, a sample size of 260 should be adequate.

The relationship between the predictor variables (Functional Independence Measure, Employment, Family Satisfaction, Pain) and the outcome variable (Life Satisfaction Index-A) will be specified and calculated using ML estimation according to the model shown in Figures A-E. The four predictor variables were measured at repeated intervals (12, 24, 48, and 60 months post burn discharge); each of these measurements (FIM, FSS, Pain, Employment) set the scale of the predictor variables identified in the model. The outcome variable of Life Satisfaction is set to the scale of the Life Satisfaction Index. Structural equation modeling (SEM) will provide both the degree (magnitude) and direction (positive or negative) of the value of the predictors individually in relation to life satisfaction.

CHAPTER IV

RESULTS

Participant Demographics

As depicted in Table 1, most participants were men (n = 209, 80.4%), white (n = 181, 69.6%) between the ages of 31 and 50 years old at the start of the study (n = 111, 42.7%). Even considering these basic descriptive statistics, there was an adequate amount of diversity among participants as 19.6% of participants were women (n = 51; a number even more impressive when considering that the majority of persons with burn injuries are male), and 29.2% were black (n = 73). The age distribution was more balanced with 34.6% participants between 18 to 30 years old (n = 90), 14.2% in the 51 to 70 age bracket (n = 37), and 8.5% 71 to 96 years old (n = 22).

Over half of the participants were employed outside of the home (full, part, or self employed, student) (n = 153, 58.8%). An additional 9.6% of participants were retired at the time of the study (n = 25), while 25.4% of participants were unemployed or had a previous disability that precluded employment (n = 66). In terms of formal education 40% (n = 104) of participants did not complete high school and 31.2% (n = 81) completed high school or obtained a Graduate Equivalent Diploma (GED) only. Approximately 25.4% (n = 66) participants received specialized or higher education in the form of trade school, associate, bachelors, or graduate degrees. The majority of participants reported being married (53.5%, n = 139), followed by single status (25.8%, n = 67), divorced (8.8%, n = 23), or widowed (5.8%, n = 15).

Table 1. Frequency Distribution of Demographic Characteristics

Variable	Participants (*N* = 260)
Marital Status	
Single	67 (25.8%)
Married	139 (53.5%)
Divorced	23 (8.8%)
Separated	10 (3.8%)
Widowed	15 (5.8%)
Other/Unknown	6 (2.3%)
Education	
Did not Complete High School	104 (40.0%)
High School Diploma/GED	81 (31.2%)
Trade School	13 (5.0%)
Some College	36 (13.8%)
Associate Degree or Bachelor's Degree	12 (4.7%)
Master's or Doctorate Degree	5 (1.9%)
Other/Unknown	8 (3.1%)
Employment Status	
Employed (Full-, Part-, Self-, Student)	153 (58.8%)
Retired	25 (9.6%)
Unemployed, Previous Disability	66 (25.4%)
Other/Unknown	16(6.2%)
Age	
18-30 years	90 (34.6%)
31-50 years	111 (42.7%)
51-70 years	37 (14.2%)
71-96 years	22 (8.5%)
Ethnicity	
Asian	3 (1.2%)
Black	73 (29.2%)
White	181 (69.6%)
Other/Unknown	3 (1.2%)
Sex	
Men	209 (80.4%)
Women	51 (19.6%)

Table 2. Number of Observations for Measures

	Number of observations		
Measurement Occasion	FIM	LSI	FSS
Time 1	253	250	246
Time 2	147	219	*
Time 3	219	171	*
Time 4	171	147	145

**Data was not collected for this time measurement*

Table 3. Means, SDs, and Model Abbreviations for Self-Report Measures by Time

Measurement Time	**FIM**	**LSI**	**FSS**
1(12 mos)			
M	122.94	12.98	54.73
SD	9.99	4.73	12.38
Model Legend	FIM12	LSI12	FSS12
2(24 mos)			
M	122.11	12.30	*
SD	12.50	4.99	*
Model Legend	FIM24	LSI24	
4(48 mos)			
M	122.88	12.67	*
SD	9.75	4.81	*
Model Legend	FIM48	LSI48	
5(60 mos)			
M	121.88	12.73	52.94
SD	11.20	5.44	11.01
Model Legend	FIM60	LSI60	

* *Data was not collected for this measurement time*

Preliminary Analysis

Tables 2 and 3 depict the number of observations, means, and standard deviations of self report measures utilized in the study. The measures were examined for internal reliability using Cronbach's Alpha. All of the predictor measures were found to be extremely reliable: FIM at 12 months post discharge (18 items; $\alpha = .94$), FIM at 24

months post discharge (18 items; α = .97), FIM at 48 months post discharge (18 items; α = .96), FIM at 60 months post discharge (18 items; α = .97), FSS at 12 months post discharge (14 items; α = .95), FSS at 60 months post discharge (14 items; α = .95). The LSI consists of two subscales; Cronbach's Alphas for the 12 positive items and 8 negative items were .82 and .76 (12 months post discharge), .82 and .78 (24 months post discharge), .80 and .69 (48 months post discharge), and .89 and .76 (60 months post discharge) respectively.

Exploratory data analysis was conducted to identify any violations of the assumption of normality, including internal consistency, outliers, variances, missing data, and univariate normality. Violations to the assumptions of normality were found for several measures: FIM 12 months post discharge (kurtosis value of .989, critical ratio .70), LSI 12 months post discharge (kurtosis value of -.736, critical ratio of .70), LSI at 24 months post discharge (kurtosis value of -.572, critical ratio of .70), FSS at 60 months post discharge (kurtosis value of -.364, critical ratio of .92), Pain at 24 months post discharge (kurtosis value of -1.81, critical ratio of -.54), Pain at 48 months post discharge (kurtosis value of -1.61, critical ratio of -.60), and Pain at 60 months post discharge (kurtosis value of -1.04, critical ratio of -.60). Additionally, FIM scores for all four time points (12 months, 24 months, 48 months, and 60 months post discharge) displayed high negative skewness, FSS at 12 months and 60 months post discharge displayed moderate positive skewness, and LSI at all time points displayed moderate to low negative skewness. These violations of normality are not cause for concern as ML estimation is generally robust despite violations of normality.

Model Results by Year

12 Months Post Discharge: Each year post burn discharge represents a potential model for understanding life satisfaction in this population. Participants were administered the FIM, FSS, Employment Status and LSI approximately 12 months post burn discharge. Correlations used in structural equation modeling to predict life satisfaction at 12 months post discharge are displayed in Table 4.

Table 4. Correlation Matrix 12 Months Post Discharge

	FIM	**FSS**	**LSI**	**Employment**
FIM	1.0			
FSS	.03	1.0		
LSI	-.05	-.25*	1.0	
Employment**	.37*	.00	-.02	1.0

**Indicates significance at the p < .05 level*
***Employment coded as (0 =unemployed, 1 =employed)*

The measurement model for this year contains four measured variables, with three (FIM, FSS, and Employment Status) loading onto the LSI. SEM analysis was conducted using maximum likelihood estimation method in MPLUS to determine the relationships between the constructs in the proposed model. Figure A depicts the proposed model with standardized path coefficients.

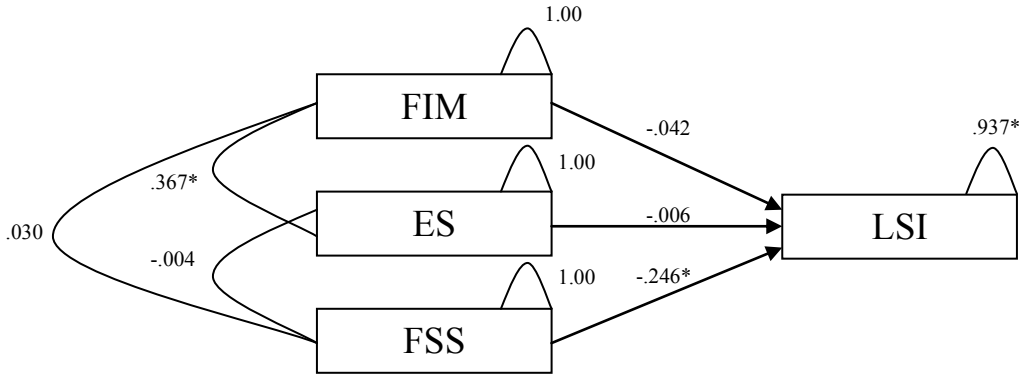


Figure A. Path Analysis of Predictors of Life Satisfaction 12 Months Post Discharge

The model is considered saturated (or "just identified") because it has three exogenous variables (FIM, FSS, and ES) loading on a single endogenous variable (LSI). The resulting T-Rule gives a value of 10, and 10 parameters are estimated. No degrees of freedom remain.

The model was significant, (χ^2 [260] = .000; $p < .001$), and the indices suggested good fit (CFI = 1.00; SRMR =.000; RMSEA =.000). This is due in part to the fact that the model is saturated and thus the path analysis is equivalent to a multiple regression model. Two pathways were significant: family satisfaction on life satisfaction (-.246, $p <$ .000) and the covariance between the endogenous variables of functional independence (FIM) and employment status (ES) (.367, $p < .000$).

The results suggest that higher family satisfaction at 12 months post discharge was significantly associated with lower reports of life satisfaction, contrary to expectations. Additionally, at 12 months post discharge participants who report

employment or engaging in work related activities (such as being a student) are more likely to report higher levels of functional independence. These values covary according to the model, suggesting a positive, bidirectional relationship. The remaining pathways, including the covariances, failed to produce significant results.

MPLUS, the statistical software used to analyze the data, produced no modification indices for this model. This indicates that the software did not calculate any added benefit to the model by adding or removing pathways to the existing model. In typical SEM analysis, this suggests that the software did not find any modifications—alternate pathways or removal of pathways—to improve the model results. With a saturated model, such as this one, all available parameters have already been estimated, which would prevent any modifications from being suggested by the software. Thus, these results are expected but not particularly indicative of the relevance of the model.

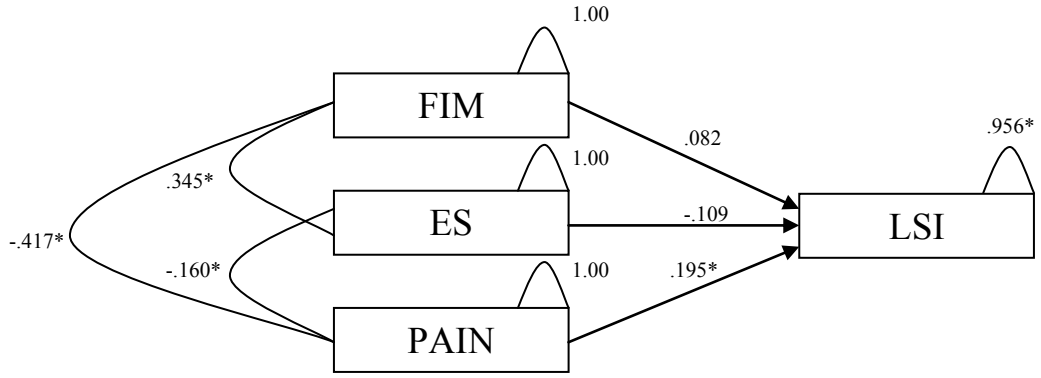
24 Months Post Discharge: In the second year of the study, participants were administered the FIM, FSS, Pain Question and LSI approximately 24 months post burn discharge. Correlations used in structural equation modeling to predict life satisfaction at 24 months post discharge are displayed in Table 5.

Table 5. Correlation Matrix 24 Months Post Discharge

	FIM	**Pain**	**LSI**	**Employment**
FIM	1.0			
Pain	-.42*	1.0		
LSI	-.04	.18*	1.0	
Employment**	.35*	-.16*	-.11	1.0

**Indicates significance at the p < .05 level*
***Employment coded as (0 =unemployed, 1 =employed)*

The model for this year contains four measured variables, with three (FIM, ES, and Pain) loading onto the LSI. SEM analysis was conducted using maximum likelihood estimation method in MPLUS to determine the relationships between the constructs in the proposed model. Figure B depicts the proposed model with standardized path coefficients.



** Indicates significance at the p < .05 level*

Figure B. Path Analysis of Predictors of Life Satisfaction 24 Months Post Discharge

The model is considered saturated, or just identified, because it has three exogenous variables (FIM, ES, and Pain) loading on a single endogenous variable (LSI). The resulting T-Rule gives a value of 10, and 10 parameters are estimated. No degrees of freedom remain.

The model was significant, (χ^2 [225] = .000; $p <$ .001) The indices suggested good fit (CFI = 1.00; SRMR = .000; RMSEA = .000). The model is saturated. Only one pathway and three covariances were significant: pain on life satisfaction (.195, $p <$ .003)

and the covariance between the endogenous variables of functional independence (FIM) and employment status (ES) (.345, $p < .000$), employment status (ES) and Pain (-.160, $p < .008$), and functional independence (FIM) and Pain (-.417, $p < .000$).

The results suggest the presence of pain at 24 months post discharge was associated with lower reports of life satisfaction. While opposite the predicted affect, this is an important result to be noted for further discussion. Several of the measures covary at this time point, including functional independence and employment. Higher functional independence was associated with employment. The presence of pain was associated with lower functional independence. Employment status at 24 months covaries with pain: those who reported pain at 24 months were more likely to concurrently report employment.

There were no modification indices for this model. Thus, there was no benefit to the model by adding or removing pathways to the existing model. With a saturated model, such as this one, all available parameters have already been estimated, which would prevent any modifications from being suggested by the program.

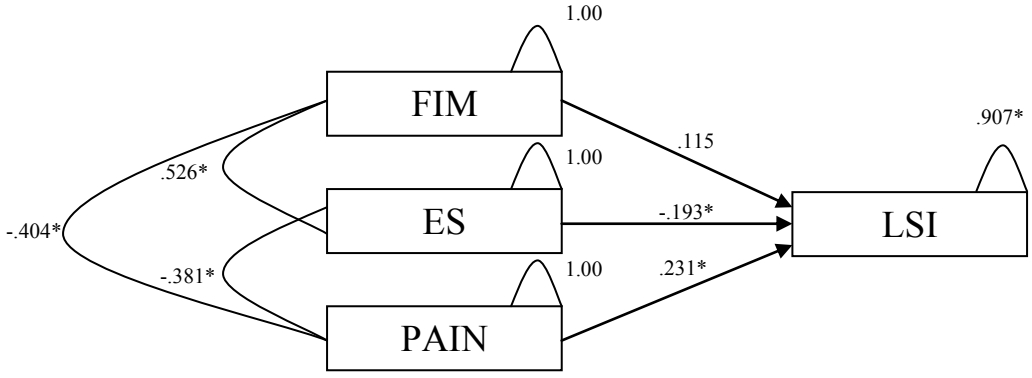
48 Months Post Discharge: In the fourth year of the study, participants were administered the FIM, Employment Status Question, Pain Question and LSI approximately 48 months post discharge. Correlations used in structural equation modeling to predict life satisfaction at 48 months post discharge are contained in Table 6.

Table 6. Correlation Matrix 48 Months Post Discharge

	FIM	Pain	LSI	Employment
FIM	1.0			
Pain	-.40*	1.0		
LSI	-.08	.26*	1.0	
Employment**	.53*	-.38*	-.22*	1.0

**Indicates significance at the p < .05 level*
***Employment coded as (0 =unemployed, 1 =employed)*

The model for this year contains four measured variables, with three (FIM, ES, and Pain) loading onto the LSI. SEM analysis was conducted using maximum likelihood estimation method in MPLUS to determine the relationships between the constructs in the proposed model. Figure C depicts the proposed model with standardized path coefficients.



** Indicates significance at the p < .05 level*

Figure C. Path Analysis of Predictors of Life Satisfaction 48 Months Post Discharge

The model is considered saturated because it has three exogenous variables (FIM, FSS, and ES) loading on a single endogenous variable (LSI). The resulting T-Rule gives a value of 10, and 10 parameters are estimated. No degrees of freedom remain.

The model was significant (χ^2 [259] = .000; $p < .001$) and the indices suggested good fit (CFI = 1.00; SRMR =.000; RMSEA =.000). Two pathways and three covariances were significant: Pain on life satisfaction (LSI) (.231, $p < .000$); employment (ES) on life satisfaction (LSI) (-.193, $p < .006$), and the covariance between the endogenous variables of functional independence (FIM) and employment status (ES) (.526, $p < .000$), employment status (ES) and Pain (-.381, $p < .000$), and functional independence (FIM) and Pain (-.404, $p < .000$).

The model indicates that the presence of pain 48 months post discharge is associated with higher life satisfaction while employment at 48 months post discharge is associated with lower life satisfaction. Lower functional impairment (FIM) was associated with being employed (ES) and with an absence of Pain. Additionally, being employed (ES) was also associated with an absence of Pain.

There were no modification indices for this model.

60 Months Post Discharge: In the fifth year of the study, participants were administered the FIM, Employment Status Question, FSS, Pain Question, and LSI approximately 60 months post discharge. Correlations used in structural equation modeling to predict life satisfaction at 60 months post discharge are contained in Table 7.

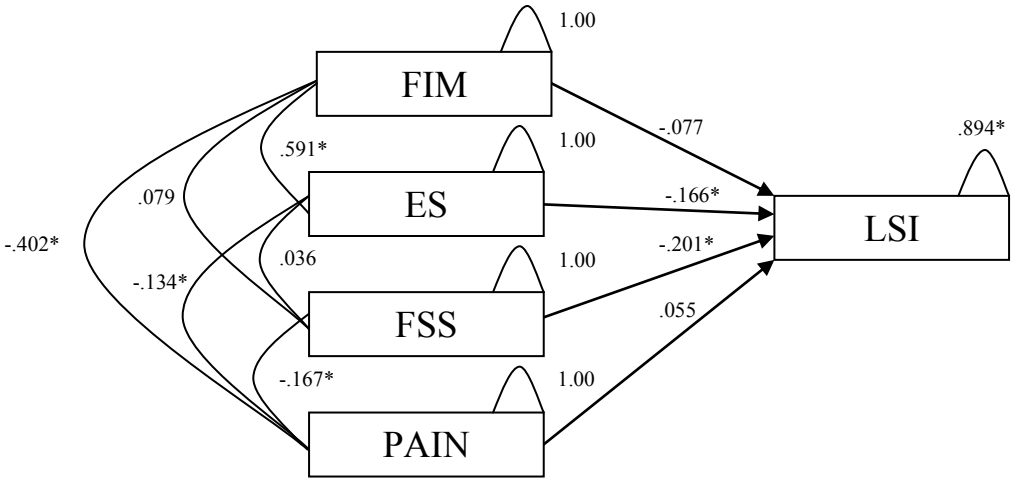
Table 7. Correlation Matrix 60 Months Post Discharge

	FIM	Pain	LSI	Employment	FSS
FIM	1.0				
Pain	-.40*	1.0			
LSI	-.21*	.14	1.0		
Employment**	.59*	-.13	-.23*	1.0	
FSS	.08	-.17*	-.22*	.04	1.0

**Indicates significance at the p < .05 level*

***Employment coded as (0 = unemployed, 1 =employed)*

The model for this year contains five measured variables, with four (FIM, FSS, ES, and Pain) loading onto LSI. SEM analysis was conducted using maximum likelihood estimation method in MPLUS to determine the relationships between the constructs in the proposed model. Figure D depicts the proposed model with standardized path coefficients.



** Indicates significance at the p < .05 level*

Figure D. Path Analysis of Predictors of Life Satisfaction 60 Months Post Discharge

The model is considered saturated because it has four exogenous variables (FIM, FSS, Pain, and ES) loading on a single endogenous variable (LSI). The resulting T-Rule gives a value of 15, and 15 parameters are estimated. There are no degrees of freedom remaining.

The model was significant (χ^2 [259] = .000; $p < .001$) while the indices suggested good fit (CFI = 1.00; SRMR = .000; RMSEA = .000). The model is saturated. Two direct pathways were significant: family satisfaction on life satisfaction (-.201, $p < .001$) and employment status on life satisfaction (-.166, $p < .023$). Four covariance pathways between exogenous variables also produced significant results, including the covariance between functional independence (FIM) and employment status (ES) (.591, $p < .000$), functional independence (FIM) and Pain (-.402, $p < .000$), family satisfaction (FSS) and Pain (-.167, $p < .006$), and employment status (ES) and Pain (-.134, $p < .028$).

These results suggest that higher family satisfaction 60 months post discharge was associated with lower life satisfaction. Being unemployed was associated with higher life satisfaction. Significant covariances at this time point include a bidirectional relationship between functional independence and pain with greater functional independence associated with the absence of pain. Greater functional independence was also associated with being employed. A third bidirectional relationship was found between employment and pain, with employment associated with an absence of pain. The final bidirectional relationship included the association between family satisfaction and pain, with reports of pain associated with lower family satisfaction.

There were no modification indices for this model.

Prospective Model: In the prospective model (see Figure E), scores are included for each active year of the study (12 months, 24 months, 48 months, and 60 months post discharge) for the FIM, FSS, Pain, Employment Status, and LSI. The model for this year contains seventeen measured variables. SEM analysis was conducted using maximum likelihood estimation method in MPLUS to determine the relationships between the constructs in the proposed model. Figure E depicts the proposed model with standardized path coefficients.

The model is considered identified with 98 degrees of freedom. The T-Rule gives a value of 153, and 55 parameters are estimated.

The model was significant (χ^2 [259] = 586.12; $p < .001$). The indices suggested moderate to good fit (CFI = .646; SRMR = .177; RMSEA = .139). In this model, seventeen pathways were significant, including the following:

Direct Pathways:

- Higher FIM scores at 12 months are directly associated with higher FIM scores at 24 months post discharge (.641, $p < .000$);
- Higher FIM scores at 24 months are directly associated with higher FIM scores at 48 months post discharge (.514, $p < .000$);
- Higher FIM scores at 48 months are directly associated with higher FIM scores at 60 months post discharge (.548, $p < .000$);
- Employment status at 12 months is directly associated with employment status at 24 months post discharge (.592, $p < .000$);

- Employment status at 24 months is directly associated with employment status at 48 months post discharge (.575, $p < .000$);
- Employment status at 48 months is directly associated with employment status at 60 months post discharge (.641, $p < .000$);
- Higher LSI scores at 24 months are directly associated with higher LSI scores at 48 months post discharge (.147, $p < .012$);
- The report of pain at 12 months is directly associated with the report of pain at 48 months post discharge (.362, $p < .000$);
- The report of pain at 48 months is directly associated with the report of pain at 60 months post discharge (.391, $p < .000$);
- FSS at 12 months post discharge is directly and inversely associated with LSI at 24 months (-.164, $p < .007$);
- FIM at 24 months post discharge is directly and inversely associated with LSI at 48 months (-.274, $p < .000$);
- Employment status at 48 months post discharge is directly and positively related to LSI at 60 months (.180, $p < .002$).

Covariances:

- FIM and Employment covary at 60 months post discharge with a positive bidirectional relationship (.241, $p < .000$);
- FIM and Pain covary at 60 months post discharge with a positive bidirectional relationship (.293, $p < .000$);

- LSI and FSS covary at 12 months post discharge with a negative bidirectional relationship (-.247, $p < .000$);
- FIM and Employment covary at 12 months post discharge with a positive bidirectional relationship (.367, $p < .000$);

Results of this prospective model indicate a relative stability across the observed variables such that characteristics reported at any one time point are excellent (and significant) predictors of characteristics at the next assessment point. Functional independence, employment status, and pain reports are significant predictors of the same measures at the next time point. Life satisfaction seems to be more volatile. Reports of life satisfaction at 24 months significantly predicted reports of life satisfaction at 48 months post discharge but there were no significant relationships between the reports at other time periods.

Family satisfaction at 12 months post discharge predicts lower reports of life satisfaction at 24 months post discharge, just as it predicted lower reports of life satisfaction at 12 months in Figure A. Higher functional independence at 24 months post discharge predicts lower reports of life satisfaction at 48 months post discharge. Lower functional independence at 48 months post discharge is predictive of higher life satisfaction reports at 60 months post discharge. Employment at 48 months was significantly predictive of life satisfaction at 60 months. The cumulative results of the model suggest that higher life satisfaction at 60 months is predicted by lower functional independence and being unemployed at 48 months post discharge.

Significant covariances in this model include the relationships between FIM and Employment 12 months post discharge, LSI and FSS 12 months post discharge, FIM and Employment at 60 months post discharge, and FIM and Pain 60 months post discharge. This pattern suggests that at 12 months post discharge higher functional independence was associated with employment while higher life satisfaction was associated with lower family satisfaction. At 60 months post discharge higher functional independence was associated with being employed, and the presence of pain.

Post Hoc Analysis

To further the understanding of unanticipated relationships between pain, employment, and life satisfaction, a series of comparative analyses were performed. A one-way between subjects ANOVA examined the differences on life satisfaction by pain conditions. There was a significant effect of pain on life satisfaction at the $p < .05$ level for the presence ($M = -.27$) versus absence of pain ($M = -.52$) for 24 months post discharge $F (1, 217) = 7.12$, $p = .008$, and 48 months post discharge $F (1, 169) = 12.0$, $p = .001$ for pain ($M = -.30$) versus absence of pain conditions ($M = -.65$). In both cases the means of the two pain conditions indicate higher reports of life satisfaction from those reporting pain versus no pain. No significant effect of pain ($M = -.34$) versus absence of pain ($M = -.54$) on life satisfaction was found for 60 months post discharge $F (1, 144) = 2.94$, $p = .089$. The means in all ANOVA calculations above for LSI reflect Rasched scores used in model analysis.

Similarly, a one-way between subjects ANOVA examined the differences on life satisfaction by employment conditions. There was no significant effect of employment

(M = -.54) versus unemployment (M = -.51) for 12 months post discharge F (1, 213) = .09, p = .764. There also was no significant effect of employment (M = -.44) versus unemployment (M = -.28) for 24 months post discharge F (1, 188) = 2.36, p = .126. Significant effects were found on life satisfaction for employment conditions both 48 months [F(1, 134) = 6.81, p = .010] and 60 months post discharge [F(1, 113) = 6.07, p = .015]. Means for both assessment times indicate those who were unemployed (M = -.29, M = -.28 respectively) reported higher levels of life satisfaction than those who were employed (M = -.61, M = -.60 respectively). The means in all ANOVA calculations above for LSI reflect Rasched scores used in model analysis.

CHAPTER V

CONCLUSIONS

Summary

To address the first hypotheses of the study, the presence of pain was originally predicted to be negatively associated with life satisfaction. In this study, the presence of pain does not seem to be negatively associated with life satisfaction; at 24 and 48 months post discharge the presence of pain was actually associated with increases in life satisfaction (.195 and .231, respectively).

This is surprising and somewhat counterintuitive. Based on previous research and anecdotal evidence among practitioners, the logical conclusion for many would be those reporting the presence of pain would be less likely to endorse items found in the LSI such as “These are the best years of my life” and “I would not change my past life even if I could”. The participants in this study consistently demonstrated the opposite effect, which begs the question of whether the results indicate a facet of burn care rehabilitation that differs from what is expected or typical of other populations (spinal cord injury, traumatic brain injury, etc.) or is merely a statistical anomaly for this particular subset and not generalizeable for the population at large.

There is some evidence to support the assertion that individuals who sustain burn injuries are capable of experiencing both distress and growth simultaneously (Rosenbach & Renneberg, 2008); perhaps the finding of the presence of pain associated with higher reports of life satisfaction reflects a similar phenomenon. The presence of pain and distress during the first year post discharge is almost universally recognized (Patterson &

Ford, 2000). In this study, the presence of pain seems to be a relatively stable construct over time. The association between the presence of pain and adjustment post burn injury remains a highly important relationship for future consideration.

Interestingly, reports of functional impairment or independence also failed to predict life satisfaction as was originally postulated when assessed in the same year as life satisfaction. For each of the four models for a given time point (12 months, 24 months, 48 months, and 60 months post discharge), FIM failed to reach statistical significance as a predictor of LSI for the same time point. While this could be based in part due to ceiling effects (despite the attempts to ameliorate ceiling effects with Rasching), it has also been suggested that the FIM may not be the most sensitive measure for individuals with burn injuries because it fails to consider burn-specific tasks related to daily living (Esselman et al., 2000). Perhaps the combination of omitted burn-specific tasks and ceiling effects renders this tool less than optimal in the burn population than was previously thought, especially for those with long term (five years) survival rates.

While functional independence fails to predict life satisfaction concurrently, in the prospective model (Figure E), functional independence is a significant predictor of life satisfaction at the next time point assessed for two time points; stated simply, FIM at 12 months predicts LSI at 24 months, and FIM at 24 months predicts LSI at 48 months post discharge. In each case the predictive relationship is negative, suggesting that while there is no immediate (same time point) predictive relationship between impairment and

life satisfaction, those who report more symptoms of impairment at any given time point are more likely to report greater satisfaction in the future.

As with the presence of pain, this result is opposite from what was expected and difficult to explain. Knowing that the association exists is a starting point to determine the mechanisms responsible for such a relationship. Perhaps those who experience impairment also simultaneously experience relief and gratitude as independence increases year to year with recovery. Perhaps some are able to better accept their impairment, resulting in a positive appraisal process that in turn leads to higher reports of life satisfaction.

A final note regarding functional impairment worth noting is the possibility that the relationship between functional impairment and life satisfaction may not be linear, as was seen with individuals with traumatic brain injuries (Mailhan, Azouvi, & Dazord, 2005). Because this study utilized structural equation modeling, it was not possible to detect nonlinear relationships. Further research is needed to identify the processes responsible for this association.

Family satisfaction and life satisfaction demonstrate the same counterintuitive results as were found with pain and functional independence. Reported family satisfaction has a significant inverse relationship with life satisfaction at both 12 (-.246) and 60 months (-.201) post discharge, suggesting that increases in family satisfaction are actually associated with decreases in endorsements of life satisfaction. Patterson et al. (2000) describe social support as possibly decreasing over time in both amount and quality, and “failure to receive the amount and type of support desired erodes satisfaction

with life". Contrary to earlier findings, these results would suggest that life satisfaction rises despite dissatisfaction with family.

A crucial distinction must be made between the constructs of "social support" and "family satisfaction" when discussing these results as they are not synonymous; the differing results may be indicative of family satisfaction functioning as a different construct from social support as in other studies, which could account for the drastically different results. Appraisal processes may be active for this variable as mentioned with the results of functional independence above. Additionally, the construct appeared to be somewhat volatile in this study, with reports of FSS at 12 months not statistically related to reports of FSS at 60 months post discharge.

Employment was significantly predictive of simultaneous reports of life satisfaction only in the later time points assessed (48 months and 60 months post discharge). At both 48 months and 60 months post discharge this predictive relationship is an inverse relationship, with employment being associated with lower life satisfaction. As is becoming a theme with these results, employment initially was thought to be associated with higher life satisfaction; this too is an opposite effect of what was expected. Employment at 48 months is also a significant, inverse predictor of life satisfaction in the future (60 months post discharge), signifying that employment at 48 months predicts lower reports of life satisfaction at 60 months post discharge. The combination of inverse relationships as well as predictive significance emerging only at the later time points emphasizes the need for long term monitoring post discharge to determine the most appropriate interventions for those sustaining burn injuries.

Although it was predicted that pain, functional impairment, family satisfaction, and employment would explain significant amounts of variance in reported life satisfaction scores over the first five years following burn injuries, only about 8% of the variance in life satisfaction scores was explained by the predicted factors at 60 months post discharge. The results of these models indicate life satisfaction five years post discharge is influenced by a variety of factors, some of which have yet to be determined.

Key knowledge from this study includes the relative stability of factors such as functional independence, employment, and pain. At each time point, functional independence, employment, and pain were significant, direct predictors of the same factors at the next assessed time (i.e., employment at 12 months predicted employment at 24 months post discharge, etc.).

Life satisfaction reports were an exception to this pattern. Scores on life satisfaction, interestingly, did not consistently predict subsequent life satisfaction reports at future time points of assessment. For instance, life satisfaction at 12 months was not statistically predictive of life satisfaction at 24 months. The one significant relationship between assessment points was the positive relationship between LSI at 24 and 48 months (.147).

The factors provided unexpected results: functional independence, pain, and family satisfaction were all negatively predictive of life satisfaction reports in the future. Employment at each time report varied, with no relationship in earlier years and varying effects during the later part of the study. Perhaps these results capture the general lack of knowledge regarding this specific population and the specific difficulties such

individuals encounter during rehabilitation. The models described in this study can best be conceptualized as an early attempt towards creating a holistic approach (Elliott & Warren, 2007), and one that includes the "interaction of…variables over time" (Patterson et al., 2000). This represents advancement in the study of holistic factors related to rehabilitation with much left undiscovered.

Recommendations

To continue the momentum of this research, it is recommended that studies continue to assess outcomes related to life satisfaction. As life satisfaction remains an important indicator of overall quality of life and the number of individuals surviving a burn injury increases, there is continued need to research the course of adjustment over time. Studies should aim to measure adjustment over five years or more as few studies have extended beyond two years post discharge in the current literature. To address the specific needs and concerns of the burn population, a more useful tool for future studies may be the Burn Specific Health Scale (rather than the FIM) with the understanding that this tool is not useful in comparison with other normative groups. Additionally, including pre-injury characteristics in future studies may enhance our understanding of outcomes. Several studies find these factors to be related to quality of life post injury, including employment (Wrigley et al., 1995), personality and coping (Lawrence & Fauerbach, 2003), history of alcohol abuse or mental health diagnosis (Patterson, 2000), and fear-avoidance coping (Sgroi,Willebrand, Ekselius, Gerdin, & Andersson, 2005). Because it is difficult, if not impossible, to predict which individuals will experience a burn injury

and subsequently measure pre-injury characteristics prior to the injury, there is a need for case control studies in prospective studies of adjustment post burn injury. If possible, the inclusion of social or cultural variables, such as access to health care, may provide better understanding of rehabilitation following a burn injury as Patterson et al. point out (1993; p. 363) the "…causes of many burns have to symptomatic of social ills or mental illness."

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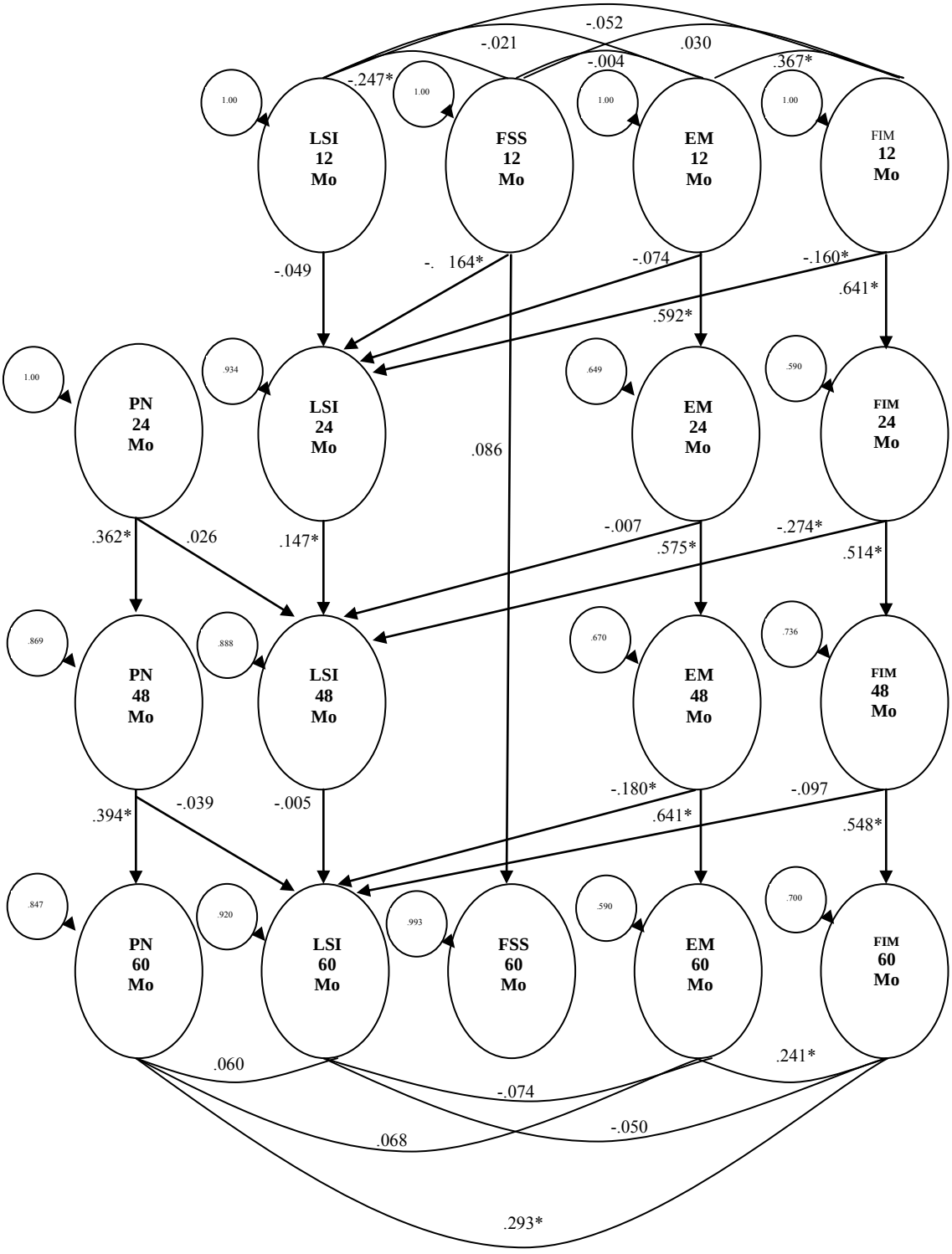
APPENDIX A



** Indicates significance at the p < .05 level*

Figure E. Path Analysis of Predictors of Life Satisfaction Longitudinal Model

APPENDIX B

Table 8. Pain Endorsement and Employment over Time

	Year 1	**Year 2**	**Year 4**	**Year 5**
Pain				
Yes	*	86	60	41
No	*	135	112	105
Unknown	*	4	2	3
Employment				
Full, Part, or Student	153	136	107	82
Retired	25	24	24	22
Unemployed or Pre.Disability	66	56	30	33
Unknown or Other	16	5	11	10

**Data on pain was not collected during year one of the study*

Table 9. Distribution of Functional Independence Measurement Scores (Rasched) 12 Months Post Discharge

FIM Rasched Score	Frequency	%
-2.94	1	0.38
0.03	1	0.38
0.18	1	0.38
0.22	1	0.38
0.25	1	0.38
0.38	1	0.38
0.40	1	0.38
0.46	1	0.38
0.55	1	0.38
0.58	1	0.38
0.65	1	0.38
0.70	1	0.38
0.73	1	0.38
0.76	2	0.77
0.79	1	0.38
0.83	1	0.38
0.88	1	0.38
0.99	4	1.54
1.06	1	0.38
1.15	2	0.77
1.26	3	1.15
1.41	3	1.15
1.63	7	2.69
1.95	12	4.62
2.45	18	6.92
3.31	18	6.92
4.64	1	0.38
4.66	166	63.85
Total	253	97.31
Missing	7	2.69
System	260	100.00

Table 10. Distribution of Functional Independence Measurement Scores (Rasched) 24 Months Post Discharge

FIM Rasched Score	Frequency	%
-3.54	1	0.38
-1.23	1	0.38
-0.14	1	0.38
-0.08	1	0.38
0.05	1	0.38
0.16	1	0.38
0.26	1	0.38
0.55	1	0.38
0.58	1	0.38
0.67	1	0.38
0.70	1	0.38
0.78	2	0.77
0.82	1	0.38
0.87	1	0.38
0.98	1	0.38
1.05	6	2.31
1.13	2	0.77
1.23	2	0.77
1.35	3	1.15
1.51	5	1.92
1.74	7	2.69
2.06	3	1.15
2.51	9	3.46
3.14	10	3.85
4.11	17	6.54
5.53	139	53.46
Total	219	84.23
Missing	41	15.77
System	260	100.00

Table 11. Distribution of Functional Independence Measurement Scores (Rasched) 48 Months Post Discharge

FIM Rasched Score	Frequency		%
-0.49	1		0.38
-0.10	1		0.38
0.64	1		0.38
0.70	1		0.38
0.76	1		0.38
0.84	1		0.38
1.31	5		1.92
1.55	2		0.77
1.87	5		1.92
2.27	1		0.38
2.70	2		0.77
3.17	7		2.69
3.65	8		3.08
4.16	1		0.38
4.72	5		1.92
5.38	12		4.62
6.31	5		1.92
7.67	112		43.08
Total	171		65.77
Missing		89	34.23
System		260	100.00

Table 12. Distribution of Functional Independence Measurement Scores (Rasched) 60 Months Post Discharge

FIM Rasched Score	Frequency	%
-1.94	1	0.38
-0.97	1	0.38
0.13	1	0.38
0.39	1	0.38
0.47	1	0.38
0.66	1	0.38
0.72	1	0.38
0.80	2	0.77
0.89	1	0.38
1.01	1	0.38
1.35	1	0.38
1.60	3	1.15
1.91	1	0.38
2.29	3	1.15
2.74	1	0.38
3.78	5	1.92
4.33	9	3.46
5.52	5	1.92
6.23	12	4.62
7.20	5	1.92
8.59	91	35.00
Total	147	56.54
Missing	113	43.46
System	260	100.00

Table 13. Distribution of Life Satisfaction Index (LSI) Scores (Rasched) 12 Months Post Discharge

LSI Rasched Score	Frequency	%
-3.49	2	0.77
-2.68	3	1.15
-2.65	1	0.38
-2.15	1	0.38
-2.11	1	0.38
-1.96	1	0.38
-1.75	8	3.08
-1.57	2	0.77
-1.40	2	0.77
-1.37	1	0.38
-1.32	2	0.77
-1.31	2	0.77
-1.29	1	0.38
-1.21	2	0.77
-1.14	1	0.38
-1.1	1	0.38
-1.08	18	6.92
-1.00	3	1.15
-0.95	1	0.38
-0.94	1	0.38
-0.93	2	0.77
-0.91	1	0.38
-0.87	1	0.38
-0.84	1	0.38
-0.81	1	0.38
-0.8	31	11.92
-0.77	1	0.38
-0.76	2	0.77
-0.74	4	1.54
-0.72	1	0.38
-0.70	5	1.92
-0.69	1	0.38
-0.67	1	0.38
-0.65	1	0.38
-0.63	1	0.38
-0.61	1	0.38
-0.52	38	14.62
-0.41	5	1.92
-0.38	1	0.38
-0.36	1	0.38

Table 13. Continued

LSI Rasched Score	Frequency	%
-0.35	1	0.38
-0.31	1	0.38
-0.26	20	7.69
-0.24	2	0.77
-0.23	1	0.38
-0.22	1	0.38
-0.18	1	0.38
-0.16	3	1.15
-0.14	2	0.77
-0.13	2	0.77
-0.06	1	0.38
-0.03	1	0.38
0.00	18	6.92
0.02	1	0.38
0.09	1	0.38
0.12	1	0.38
0.20	1	0.38
0.21	1	0.38
0.23	1	0.38
0.26	8	3.08
0.28	1	0.38
0.31	1	0.38
0.33	1	0.38
0.36	1	0.38
0.43	1	0.38
0.44	1	0.38
0.47	1	0.38
0.49	1	0.38
0.51	1	0.38
0.52	10	3.85
0.62	1	0.38
0.63	1	0.38
0.68	1	0.38
0.76	1	0.38
0.79	1	0.38
0.97	1	0.38
1.04	1	0.38
1.05	1	0.38
1.38	1	0.38
Total	250	96.15
Missing	10	3.85
System	260	100.00

Table 14. Distribution of Life Satisfaction Index (LSI) Scores (Rasched) 24 Months Post Discharge

LSI Rasched Score	Frequency	%
-3.45	2	0.77
-1.95	2	0.77
-1.73	4	1.54
-1.68	1	0.38
-1.48	1	0.38
-1.39	3	1.15
-1.36	1	0.38
-1.30	1	0.38
-1.26	1	0.38
-1.19	1	0.38
-1.18	1	0.38
-1.16	1	0.38
-1.11	1	0.38
-1.09	1	0.38
-1.08	16	6.15
-1.06	1	0.38
-0.99	1	0.38
-0.93	1	0.38
-0.89	1	0.38
-0.79	24	9.23
-0.74	1	0.38
-0.72	2	0.77
-0.71	5	1.92
-0.70	1	0.38
-0.69	1	0.38
-0.68	1	0.38
-0.67	1	0.38
-0.63	2	0.77
-0.61	1	0.38
-0.59	1	0.38
-0.57	1	0.38
-0.55	1	0.38
-0.54	1	0.38
-0.53	25	9.62
-0.51	2	0.77
-0.47	2	0.77
-0.45	1	0.38
-0.43	4	1.54
-0.39	1	0.38
-0.36	1	0.38

Table 14. Continued

LSI Rasched Score	Frequency	%
-0.35	1	0.38
-0.33	1	0.38
-0.31	1	0.38
-0.27	23	8.85
-0.23	2	0.77
-0.22	1	0.38
-0.18	1	0.38
-0.17	1	0.38
-0.16	1	0.38
-0.12	3	1.15
-0.01	13	5.00
0.01	1	0.38
0.02	2	0.77
0.10	1	0.38
0.11	1	0.38
0.12	6	2.31
0.22	2	0.77
0.24	12	4.62
0.29	1	0.38
0.32	1	0.38
0.33	1	0.38
0.42	3	1.15
0.47	1	0.38
0.48	1	0.38
0.50	6	2.31
0.66	1	0.38
0.67	1	0.38
0.73	1	0.38
0.77	3	1.15
0.80	1	0.38
1.06	2	0.77
1.08	1	0.38
1.36	1	0.38
1.55	1	0.38
Total	219	84.23
Missing	41	15.77
System	260	100.00

Table 15. Distribution of Life Satisfaction Index (LSI) Scores (Rasched) 48 Months Post Discharge

LSI Rasched Score	Frequency	%
-2.83	1	0.38
-2.29	1	0.38
-1.87	2	0.77
-1.82	1	0.38
-1.79	1	0.38
-1.66	1	0.38
-1.50	7	2.69
-1.47	1	0.38
-1.32	1	0.38
-1.16	13	5.00
-1.12	2	0.77
-1.11	1	0.38
-1.10	1	0.38
-1.08	1	0.38
-1.04	1	0.38
-1.00	1	0.38
-0.93	1	0.38
-0.87	1	0.38
-0.84	22	8.46
-0.83	3	1.15
-0.81	1	0.38
-0.80	1	0.38
-0.77	3	1.15
-0.75	1	0.38
-0.71	3	1.15
-0.69	2	0.77
-0.64	1	0.38
-0.62	2	0.77
-0.60	2	0.77
-0.54	17	6.54
-0.53	1	0.38
-0.51	1	0.38
-0.50	3	1.15
-0.46	3	1.15
-0.42	1	0.38
-0.37	1	0.38
-0.36	1	0.38
-0.35	1	0.38
-0.26	1	0.38
-0.25	10	3.85

Table 15. Continued

LSI Rasched Score	Frequency	%
-0.24	1	0.38
-0.22	1	0.38
-0.20	1	0.38
-0.18	1	0.38
-0.17	3	1.15
-0.15	1	0.38
-0.13	1	0.38
-0.08	1	0.38
-0.06	1	0.38
-0.04	1	0.38
-0.03	1	0.38
-0.02	1	0.38
0.00	1	0.38
0.01	2	0.77
0.02	1	0.38
0.03	5	1.92
0.06	1	0.38
0.08	1	0.38
0.14	1	0.38
0.16	1	0.38
0.18	1	0.38
0.25	1	0.38
0.26	1	0.38
0.28	2	0.77
0.30	1	0.38
0.31	4	1.54
0.35	1	0.38
0.36	1	0.38
0.47	1	0.38
0.49	1	0.38
0.53	1	0.38
0.54	1	0.38
0.57	1	0.38
0.59	1	0.38
0.64	2	0.77
0.76	1	0.38
0.80	1	0.38
0.88	1	0.38
1.06	1	0.38
1.18	1	0.38
Total	171	65.77
Missing	89	34.23
System	260	100.00

Table 16. Distribution of Life Satisfaction Index (LSI) Scores (Rasched) 60 Months Post Discharge

LSI Rasched Score	Frequency	%
-3.13	1	0.38
-1.84	2	0.77
-1.81	1	0.38
-1.49	1	0.38
-1.47	3	1.15
-1.38	1	0.38
-1.37	1	0.38
-1.35	1	0.38
-1.33	1	0.38
-1.29	1	0.38
-1.25	1	0.38
-1.23	2	0.77
-1.13	6	2.31
-1.09	2	0.77
-1.08	1	0.38
-1.07	1	0.38
-1.00	1	0.38
-0.93	3	1.15
-0.89	1	0.38
-0.82	17	6.54
-0.77	2	0.77
-0.75	7	2.69
-0.71	3	1.15
-0.69	1	0.38
-0.63	1	0.38
-0.61	2	0.77
-0.59	1	0.38
-0.58	1	0.38
-0.57	2	0.77
-0.55	1	0.38
-0.52	9	3.46
-0.50	1	0.38
-0.49	2	0.77
-0.48	2	0.77
-0.44	1	0.38
-0.38	4	1.54
-0.34	1	0.38
-0.28	1	0.38

Table 16. Continued

LSI Rasched Score	Frequency	%
-0.26	1	0.38
-0.24	1	0.38
-0.23	5	1.92
-0.18	1	0.38
-0.15	1	0.38
-0.14	1	0.38
-0.13	2	0.77
-0.10	1	0.38
-0.07	2	0.77
-0.04	1	0.38
-0.03	2	0.77
-0.01	2	0.77
0.05	8	3.08
0.08	2	0.77
0.09	1	0.38
0.10	1	0.38
0.11	1	0.38
0.13	1	0.38
0.16	3	1.15
0.17	1	0.38
0.20	1	0.38
0.22	2	0.77
0.23	1	0.38
0.28	2	0.77
0.32	3	1.15
0.36	2	0.77
0.38	1	0.38
0.42	1	0.38
0.45	1	0.38
0.50	1	0.38
0.55	1	0.38
0.60	1	0.38
0.97	1	0.38
1.44	1	0.38
Total	147	56.54
Missing	113	43.46
System	260	100.00

Table 17. Distribution of Family Satisfaction Scores (FSS) (Rasched) 12 Months Post Discharge

FSS Rasched Score	Frequency	%
-5.13	1	0.38
-2.44	1	0.38
-2.12	1	0.38
-2.03	1	0.38
-1.86	1	0.38
-1.55	1	0.38
-1.46	1	0.38
-1.37	2	0.77
-1.19	1	0.38
-1.12	1	0.38
-0.78	3	1.15
-0.71	1	0.38
-0.70	3	1.15
-0.62	2	0.77
-0.54	1	0.38
-0.45	3	1.15
-0.37	3	1.15
-0.28	2	0.77
-0.20	1	0.38
-0.19	9	3.46
-0.10	2	0.77
-0.01	2	0.77
0.08	4	1.54
0.18	6	2.31
0.28	7	2.69
0.38	6	2.31
0.48	6	2.31
0.59	3	1.15
0.70	13	5.00
0.81	6	2.31
0.93	12	4.62
1.05	4	1.54
1.11	1	0.38
1.13	1	0.38
1.17	5	1.92
1.30	16	6.15
1.42	1	0.38
1.43	8	3.08

Table 17. Continued

FSS Rasched Score	Frequency	%
1.57	8	3.08
1.71	4	1.54
1.86	6	2.31
2.02	5	1.92
2.19	5	1.92
2.37	5	1.92
2.58	3	1.15
2.81	3	1.15
3.08	3	1.15
3.32	1	0.38
3.41	2	0.77
3.77	1	0.38
3.86	7	2.69
4.60	3	1.15
4.73	1	0.38
5.84	47	18.08
Total	246	94.62
Missing	14	5.38
System	260	100.00

Table 18. Distribution of Family Satisfaction Scores (FSS) (Rasched) 60 Months Post Discharge

FSS Rasched Score	Frequency	%
-3.38	1	0.38
-2.64	1	0.38
-1.66	1	0.38
-1.54	1	0.38
-1.33	1	0.38
-1.00	1	0.38
-0.84	2	0.77
-0.67	3	1.15
-0.51	4	1.54
-0.34	3	1.15
-0.18	2	0.77
-0.15	1	0.38
-0.01	2	0.77
0.15	3	1.15
0.31	3	1.15
0.47	5	1.92
0.62	6	2.31
0.78	5	1.92
0.93	3	1.15
1.08	8	3.08
1.23	3	1.15
1.38	6	2.31
1.53	6	2.31
1.68	10	3.85
1.83	1	0.38
1.97	7	2.69
2.12	6	2.31
2.27	5	1.92
2.42	2	0.77
2.57	2	0.77
2.73	3	1.15
2.90	4	1.54
3.07	4	1.54
3.21	1	0.38
3.26	2	0.77
3.47	1	0.38
3.70	1	0.38
4.30	1	0.38

Table 18. Continued

FSS Rasched Score	Frequency	%
4.75	2	0.77
5.49	1	0.38
6.73	21	8.08
Total	145	55.77
Missing	115	44.23
System	260	100.00

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